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ABSTRACT

The development of Q methodology is briefly reviewed, and the methodology itself is briefly described. Finally, a number of the issues are raised relating to the use of Q. Q methodology can have fruitful applications if it is not used indescriminately. Appropriate use of Q requires careful attention to the way the problems being researched are defined. (Author/AG)

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Q TECHNIQUE AND ITS METHODOLOGY:

A BRIEF INTRODUCTION AND CONSIDERATION

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INTRODUCTION

Traditionally, in factor analysis, we are concerned with the following kind of data matrix in its most elementary form:

Persons (rows):	Test Items (columns)						
	1	2	3	...	j	...	k
1	X_{11}	X_{12}	X_{13}	...	X_{1j}	...	X_{1k}
2	X_{21}	X_{22}	X_{23}	...	X_{2j}	...	X_{2k}
3	X_{31}	X_{32}	X_{33}	...	X_{3j}	...	X_{3k}
...	...	...	...	...	...	...	...
i	X_{i1}	X_{i2}	X_{i3}	...	X_{ij}	...	X_{ik}
...	...	...	...	...	...	...	...
n	X_{n1}	X_{n2}	X_{n3}	...	X_{nj}	...	X_{nk}

R - Analysis

Any score from this matrix, "X_{ij}," indicates the "i'th" person's score on the "j'th" test item. A typical example of such a matrix of more recent vintage might result from administration of an Osgood semantic differential. A sample of "n" persons would evaluate a single concept using a set of "k" bi-polar adjective scales. An R factor analysis would simply involve correlating columns or test items in this matrix for a sample of persons and factoring out clusters of test items. You would be concerned with the way items order persons and with grouping them into sets of items which order people in similar ways. Each group of items would be associated with a distinctive common ordering of people.

A data matrix, in its most elementary form, for Q-factor analysis, would look quite similar to the above matrix. However, there is a fundamental difference in the way the data would be obtained from the people which I will get into a bit later. In the Q-factor analysis, instead of correlating columns in the matrix, you would correlate rows or persons and factor out clusters or groupings of persons. You would be concerned with the way people order items and with grouping them into clusters of people who order items in similar ways. Each group of persons would be associated with a distinctive common ordering of the items.

Early History

Factoring persons instead of items is not a new idea. Names such as Spearman, Thomson, and Burt have been associated with correlation of persons as variables since the very early 1900's. However, in 1935, both Godfrey Thomson and William Stephenson published papers explicitly recognizing the potential of factoring correlations among persons. Thomson was quite pessimistic about the future of this "new" methodology, but Stephenson was quite optimistic. Stephenson has been the main proponent and conceptual developer of the Q-methodological approach. Stephenson's major comprehensive statement on Q-methodology was published in 1953 under the title of: The Study of Behavior: Q-Technique and its Methodology. Over the years, there has been a substantial controversy developed between Stephenson and many of the R factor analysts. In general, each has dismissed the other as irrelevant and immaterial.

This does not mean that Stephenson has not had his supporters. Carl Rogers used Q-methodology quite extensively in his client-centered psychotherapy starting in the late forties. Jack Block (1961) calls Stephenson "the ingenious innovator,

vigorous proponent and almost solitary expositor of the Q-method". Mal MacLean, a respected communication researcher, considers Stephenson as "one of the most creative scholars in the whole field of human behavior". Steven Brown (1968), a political scientist at Kent State, has published the most comprehensive bibliography to date that I am aware of of references on Q-technique, nearly 600 in all. This does not include some references I know of. Stephenson's Q-methodology has been used in various forms by a sizable number of behavioral science researchers of considerably varied backgrounds.

The Q Sort

Stephenson maintains that "Q-technique provides a systematic way to handle a person's retrospections, his reflections about himself and others, his introjections and projections, and much else of an apparent subjective nature (1953, p. 86)." The main vehicle for achieving this is the Q-sort. A "universe" of stimuli (for example, statements, pictures, words, musical selections, photographs, magazine articles, etc.) is defined which is deemed relevant to the problem being investigated. Q seems to be particularly suited to the study of decision behavior where the focus is on representing personal choices and preferences of all varieties. A sample of stimuli from the defined universe is constructed.

In the Q-sort, the individual is asked to examine the sample of stimuli in detail. Let's suppose the problem being investigated are patterns of feelings about the Viet Nam war. The Q-sort could consist of a number of self-referent opinion statements concerning the war. Each statement would be placed on a separate card. The person would be asked to read the statement on each card to get some idea of the kinds of positions represented by the statements on the cards. Next, he would

be asked to make a rough sort of the statements into probably three piles: those statements with which he personally agrees, those with which he disagrees, and those with which he neither agrees nor disagrees or is not sure of.

Next, the person would be asked to further sort the statements along the continuum, from strongly agree to strongly disagree, making more refined discriminations. There would be a specified number of piles along the continuum into which he is to sort the statements on the cards. The person would be requested to put a specified number of cards in each pile. The distribution of cards would form a quasi-normal distribution. Visually, the final sort might be represented by the following (each X represents a card with an opinion statement on it):

				X	X	X					
			X	X	X	X	X	X	X		
			X	X	X	X	X	X	X		
		X	X	X	X	X	X	X	X	X	
STRONGLY	X	X	X	X	X	X	X	X	X	X	X	STRONGLY
AGREE	X	X	X	X	X	X	X	X	X	X	X	DISAGREE
Score	10	9	8	7	6	5	4	3	2	1	0	
Frequency	2	3	5	5	6	6	6	5	5	3	2	

Number of Statement (cards) = 48

In Q, the person is instructed to permit the statements or stimuli to interact with each other. He is supposed to evaluate the statements with reference to one another. Such is not the case with the typical R study. For example, Osgood

suggests the following be included in the instructions for the typical semantic differential study (1957, pp. 83-84):

> Sometimes you may feel as though you've had the same item before on the test. This will not be the case, so do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the test. Make each item a separate and independent judgement. Work at fairly high speed through the test. Do not worry over or puzzle over individual items. It is your first impression, the immediate "feelings" about the items, that we want. On the other hand, please do not be careless, because we want your true impressions.

It seems obvious that the intent of such instructions is to reduce item or stimuli interaction. In R, the judgements of the items or stimuli are supposed to be independent of one another; in Q, the opposite is true. In R, the focus is on how the person deviates on a given item from the mean of all other persons on that item. In Q, the focus is on how a given item of a given person deviates from the mean of all other items for that person. In summary: R is normative; Q is ipsative. These notions are at the heart of the argument Stephenson raises at the suggestion by some that Q and R are different approaches to similar ends and that Q is simply the observe or transpose of R.

Major Steps in a Typical Q-Study*

1. Respondents are asked to sort a deck of cards which have items printed on them into a specific number of ranked piles according to a modified normal distribution. The sorting is done on the basis of some criterion, e.g., belief-disbelief, agree-disagree, etc.

2. A matrix of intercorrelations is formed by correlating every person's sort of items with every other person's sort of items.

3. This matrix of intercorrelations is submitted to factor analysis so that persons are variables and items are observations. A principle axis solution is obtained. This is submitted to a varimax rotation which produces orthoganal factors. On this basis, a factor represents a grouping of persons around a common pattern of sorting the items. Hence, a factor represents a type of person.

4. Each pattern of sorting the items associated with each factor or type of person is estimated. This is done by weighting each item response of each of the persons most highly associated with a given factor by the degree to which they are loaded on that factor. The higher a person's loading on the factor, the greater is the weight. These weighted responses are summed across each item separately. This produces an item array of weighted responses for each factor in the rotated factor analysis solution selected. The arrays of weighted responses are then converted to z-scores.

5. The arrays of item z-scores are ordered from most accepted to most rejected for each factor. This provides a hierarchy of item acceptance for each factor or type of persons.

6. The arrays of items z-scores for each factor are compared by subtraction for each pair of factors. This produces arrays of different scores for each pair of factors. This provides the basis for differentiating one factor or type of persons from another.

*Reprinted from: MacLean, Danbury, and Talbott, Civil Defense Belief Patterns: (VIII) Technical Summary. East Lansing: Department of Communication, Michigan State University, OCD report, March, 1964.

Brief Highlighting of Some Issues Which Should Concern Potential Users of Q-Methodology

1. *Should a forced or unforced Q-sort of distribution be used?*

This issue has spawned a number of pieces of research over the years. Opinions differ as to which is the most appropriate. Originally, before computers, there was a great computational convenience to be served by using forced distributions. Every variable or person has the same mean and variance. This greatly simplified calculation of the correlations. In my opinion, there is no way to definitively answer this issue. My feeling is that a researcher should take a problem centered approach to this and let the way the data are collected grow out of the purposes and definitions of the research project.

2. *How should items be selected?*

In general, items should come from the people being studied. They should be phrased and structured in the language they use to talk and think about the issues you want to explore. If the people you are studying cannot make any sense out of your items, of what value is the study? One very good source of items is from focused interviews. In them, you get the people talking about the issues you want to study. After you have developed some items from such interviews, take them back to the people and get their reactions to them to see if you are on the track. After you have made a tentative selection of items for a Q-sort, get some people from the study population to sort them. After they have sorted them, probe into the choices they have made, their reasons for these choices, and what they think the statements mean to them. These are rich sources of items that are often overlooked

in Q-studies.

Another aspect of this particular issue relates to what Stephenson called structured samples of items. Through the use of a factorial design, items can be constructed to meet the requirements of a multivariate category scheme. This offers a rationale which permits item selection to follow some theoretical notions. Guttman's facet analysis should be explored as a possible way to structure item samples. I have used, and have seen used, structured samples in a number of studies in which I have found quite revealing, interesting and rewarding.

3. *How should people be selected?*

This is another issue which should be carefully thought out by the researcher who uses Q. Quite often, the people sample is quite small and very explicitly and purposively chosen. The important notion is to do your best to get representatives of the major patterns or views of the people being studied. You want to select a sample of persons which maximizes the different points of view. Sometimes, if you sample randomly, you might leave out very small but important segments of the study population. Just as you sometimes find useful the structuring of item samples, sometimes this is quite useful for the people sample. It might permit you to build into your study some important theoretical notions or ideas.

4. *What about reliability and validity issues?*

The typical reliability issue has been sort, re-sort reliability. This has been found to be quite high (reports as high as .97) in some instances. However, there are some other reliability and validity issues which do not get considered very often. In some instances individual Q-sort, re-sort may not be sufficient. What about instances in which there is some degree of individual change going on.

Then, this issue might be better restated as whether or not the same predominate or major patterns or types of persons emerge upon repeated occasions. Given that I have used purposive people samples, I may not have a good idea of how the types are distributed in the study population even though I may have reliable knowledge of what the major types are. What would seem to be called for would be some large sample survey research. Direct application of Stephenson's Q-techniques are probably not economically feasible in such situations due to their complexity and time needed for administration and analysis. I have developed a questionnaire technique along lines suggested by Stephenson which seems to have some utility in assigning people to Q-types. It is a technique which can be readily applied in large sample survey research. The method involves the construction of "Q-Blocks" which are comparable in one sense to a series of small individual Q-sorts. Detailed knowledge of a stable Q-typology is necessary for construction of these Q-Blocks. This knowledge can be gained from direct application of Q-techniques to smaller, usually structured samples of people from the population in which the researcher is interested.

5. *Are there other alternatives for clustering types of person other than factor analysis?*

Factor analysis is a complex mathematical procedure. It frightens some people away from the use of Q. Louis McQuitty has a number of clustering techniques which, under some circumstance, may have a lot to offer. Some of them are based on non-metric indicies of association and classification procedures. With some kinds of data, non-metric classification procedures would have definite appeal. A number of articles by McQuitty are included in the references. I have utilized a number of

his techniques as well as some which include my own elaborations and modifications. The appeal for me with McQuitty's clustering techniques is their great flexibility. This permits me to be much more problem centered in my research. I do not have to force every problem I want to research along Q lines into the same old inflexible factor analytic model.

Closing

In closing, I would like to stress that I feel the most fruitful applications of Q are heavily problem centered in approach. The purposes for doing Q-study should be carefully thought out. A great deal of attention should be devoted to plotting out the study in the image of the way you, as the researcher, want to name and define the problems you are studying. When Stephenson does a Q-study, he seems always to want to know something about the people he is studying because he wants to develop some strategy for dealing with those people. It seems to be a very action oriented research. I am quite interested in a kind of communication studies which point in the direction of understanding groups of people so that you can develop communication strategies relative to them. I have found Q rather useful in such studies. I guess this is why I think Q-methodology would be of value in the study of problems educational administrators seem to be interested in.

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